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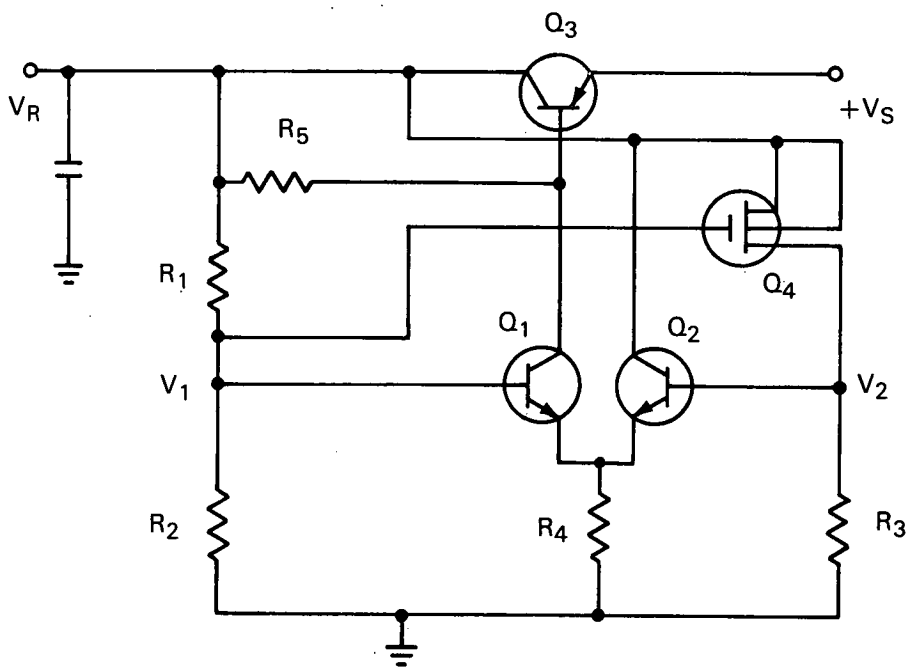
NASA TECH BRIEF

MOSFET Improves Performance of Power Supply Regulator



This circuit provides a higher degree of power supply voltage regulation and temperature compensation than a conventional circuit using a zener diode as a voltage reference. This improvement is effected by using a MOSFET (Metal Oxide Semiconductor Field Effect Transistor), Q_4, as the voltage reference in place of the zener diode. As in the case of the conventional regulator, the improved regulator utilizes a bridge circuit R_1, R_2, Q_4 (in place of a zener diode), and R_3 and a difference amplifier consisting of Q_1, Q_2, and R_4, with R_5 allowing initial operation at power turn-on. The regulator performance is determined by the voltage difference between V_1 and V_2 produced by a change in regulator supply V_R. The difference amplifier gain and the current gain of transistor Q_3 amplify this voltage difference to determine the closed loop performance. Cross coupling of the gate of Q_4 to the base of Q_1 allows Q_4 to serve also as an additional amplifier.

Note:

Inquiries concerning this circuit may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland 20771
Reference: B67-10569

(continued overleaf)

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Donald C. Lokerson
(GSC-10022)